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EXAMINER	
LEE, ANDREW CHUNG CHEUNG	
ART UNIT	**PAPER NUMBER**
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/20/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/080,509	PIIRAINEN, OLLI	
	Examiner	Art Unit	
	Andrew C. Lee	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-11,13-20 and 22-26* is/are rejected.

7)☒ Claim(s) *4,12,21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 18 – 26 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited. The claims do not indicate clearly whether the claims disclose as method or disclose as apparatus.

3. Claims 18 – 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims hence disclosed are very ambiguous because the way that the claims written is impossible for a person skilled in art to distinguish which portion of the claim is preamble and which portion of the claim is the claimed subject matter.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 26 recite the limitation "at the beginning of the burst", and "at the end of the burst", respectively. There is insufficient antecedent basis for "the burst".

Claim 1 recites the limitation "at the beginning of the burst" in line 14, and "at the end of the burst" in line 18 of page 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "at the beginning of the burst" in line 11 of page 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "at the end of the burst" in line 11 of page 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation "at the beginning of the burst" in line 14, and "at the end of the burst" in line 18 of page 4. There is insufficient antecedent basis for this limitation in the claim.

Claim10 recites the limitation "at the beginning of the burst" in line 10 of page 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "at the beginning of the burst" in line 11, and "at the end of the burst" in line 15 of page 6. There is insufficient antecedent basis for this limitation in the claim.

Claim19 recites the limitation "at the beginning of the burst" in line 14, and "at the end of the burst" in line 18 of page 2. There is insufficient antecedent basis for this limitation in the claim.

The dependent claims are also rejected since they depend upon a rejected base claim and contain the same problems.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1 – 3, 5, 7 – 11, 13, 15 – 20, 22, 24 – 26, are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al. (US 6721367 B1) in view of Yukitomo et al. (US 6191736 B1), Moulsley (US 6470006 B1) and Nakamura et al. (US 6442218 B1).

Regarding claims 1, 2, 3, 9, 10, 11, 18, 19, 20, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6), comprising: measuring the strength of the signal the base station receives in at least two consecutive time slots (recited "the two weighting factors of path A and path B are selected and transmission with directivities for both paths is performed . Path A is output with time slot 1 and path B is output with time slot 2" as measuring the strength of the signal the base station receives in at least two consecutive time slots; column 12, lines 20

– 25), Miya et al. also disclose implicitly determining a first weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a previous time slot (recited "calculate the power of the correlator output and detect times t0 and t1" as determining a first weighting coefficient; column 8, lines 50 – 54), determining a second weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a following time slot (column 9, lines 1 – 8).

However, Miya et al. do not teach explicitly determining a first weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a previous time slot, determining a second weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a following time slot.

Yukitomo et al. teach explicitly determining a first weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a previous time slot (recited "calculate weights using previous received signals" determining a first weighting coefficient; column 3, lines 3 – 7), determining a second weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a following time slot (recited "calculate optimal weights using current received signals" determining a second weighting coefficient; column 3, lines 8 – 12). It would have been

obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include determining a first weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a previous time slot, determining a second weighting coefficient by comparing the strength of the signal the base station receives in a time slot with the strength of the signal the base station receives in a following time slot such as that taught by Yukitomo et al. in order to provide a data communication apparatus and data communication method capable of receiving radio signals without deterioration of reception performance even in the case where an radio signal's direction of arrival changes rapidly as suggested by Yukitomo et al. (see column 2, lines 1 – 5).

Miya et al. and Yukitomo et al. do not disclose explicitly reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable, reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable. Moulsley discloses the limitation of reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable enough to produce an erroneous bit decision (recited "adjusting the timing of subsequent time slots for the channel to reduce interference from the

detected interferers" abstract, lines 9 – 11; "the number of corrupted bits provides an indication of the level of interference at the beginning of the time slots"; column 4, lines 50 – 58), reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable enough to produce an erroneous bit decision (recited "adjusting the timing of subsequent time slots for the channel to reduce interference from the detected interferers" abstract, lines 9 – 11; "the number of corrupted bits provides an indication of the level of interference at the beginning and at the end of the time slots"; column 4, lines 50 – 58 as reducing at least one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable enough to produce an erroneous bit decision). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. and Yukitomo et al. to include reducing by means of the first determined weighting coefficient in soft bit decision-making the significance of at least one symbol at the beginning of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable, reducing by means of the second determined weighting coefficient in soft bit decision-making the significance of at least-one symbol at the end of the burst the base station receives in a time slot if the difference between the measured signal strengths is considerable such as that taught by Moulsley in order to a method of controlling the timing of a transmission time slot within a time frame, a channel being

allocated to the time slot for transmission from a transmitting station to a receiving station as suggested by Yukitomo et al. , see column 1, lines 66 – 67, column 2, lines 1 – 3). Both Miya et al. and Yukitomo et al. teach in which the strength of a signal received at a base station is measured (Miya et al, recited "selects a weighting factor based on the reception quality" as the strength of a signal received at a base station is measured, column 9, lines 21 – 23; Yukitomo et al., recited "measuring the received signal power", column 4, lines 66 – 67). However, Miya et al., Yukitomo et al. and Moulsley fail to disclose a decoder for soft decision-making is employed. Nakamura et al. disclose explicitly the limitation of a decoder for soft decision-making is employed (recited "include a soft-decision unit for carrying out a soft decision" as a decoder for soft decision-making is employed; Fig. 2, element 2-3a, column 6, line 67, column 7, lines 1 – 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al., Yukitomo et al. and Moulsley to include a decoder for soft decision-making is employed such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large as suggested by Nakamura et al.(see column 3, lines 21 – 26).

Regarding claims 5, 13, 22, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted

using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al. do not disclose explicitly a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower than 1. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower than 1 (recited "the tentatively decided data is larger than the predetermined value (e.g. 0.5), the weight W_2 is set to a relatively large value" as the weighting coefficients are higher than 0 but lower than 1; column 12, lines 60 – 69). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients are higher than 0 but lower than 1such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large (as suggested by Nakamura et al., see column 3, lines 21 – 26).

Regarding claims 7,15, 24, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al.

do not disclose explicitly a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot (recited "the first weight-coefficient-multiplication unit has a fixed weight (e.g. 1 as in this example)" as the weighting coefficients have the same values for all symbols to be weighted in each time slot; column 12, lines 24 – 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients have the same values for all symbols to be weighted in each time slot such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large as suggested by Nakamura et al. (see column 3, lines 21 – 26).

Regarding claims 8, 16, 25, Miya et al. disclose the limitation of a method and means for improving the quality of data transmission in cellular radio systems utilizing time division multiple access (recited "TDMA system, it is desirable to suppress multi-path propagation by transmitting signals to either path A or path B, each signal is transmitted using a separate slot" as improving the quality of data transmission in cellular radio systems utilizing time division multiple access; Fig. 15, column 12, lines 1 – 6). Miya et al. do not disclose explicitly a method and means as claimed in claimed wherein the

weighting coefficients have different values for different symbols to be weighted in each time slot. Nakamura et al. disclose the limitation of a method and means as claimed in claimed wherein the weighting coefficients have different values for different symbols to be weighted in each time slot (recited "the second weight-coefficient-multiplication unit has a weight W_2 which varies in accordance with the signal r_{rel} indicative of a reliability of the tentatively decided data" as the weighting coefficients have different values for different symbols to be weighted in each time slot; column 12, lines 25 – 28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al. to include a method and means as claimed in claimed wherein the weighting coefficients have different values for different symbols to be weighted in each time slot such as that taught by Nakamura et al. in order to provide a demodulator which can improve a transmission-line estimate by using tentatively decided data symbols as pilot symbols, and, at the same time, avoids degradation in accuracy of the transmission-line estimate when error rate of the tentatively decided data symbols grows large as suggested by Nakamura et al. (see column 3, lines 21 – 26).

Regarding claims 17, 26, Miya et al. disclose the limitation of a base station receiver as claimed wherein the base station receiver is implemented by a processor (recited "processing circuits" a processor, Fig. 13)

8. Claims 6, 14, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya et al. (US 6721367 B1), Yukitomo et al. (US 6470006 B1), Moulsley (US 6470006

B1) and Nakamura et al (US 6442218 B1) as applied to claims 1 – 3, 5, 7 – 11, 13, 15 – 20, 22, 24 – 26, above, and further in view of Shen et al. (US 6483884 B1).

Regarding claims 6, 14, Miya et al., Yukitomo et al. and Nakamura et al. do not disclose explicitly a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement. Shen et al. disclose the limitation of explicitly a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement (recited "are sequentially processed into received signal strength indicators $RSSI_0$ and $RSSI_1$ are stored " as the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement; Fig. 1, column 3, lines 29 – 46). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Miya et al., Yukitomo et al. and Nakamura et al. to include a method and means as claimed in claimed wherein the strength of the signal received at the base station is determined using RSSI (Received Signal Strength Indicator) measurement such as that taught by Shen et al. in order to designed to select the best antenna based on real and time delay quality indicators (as suggested by Shen et al., see column 1, lines 8 – 10).

Allowable Subject Matter

9. Claims 4, 12, 21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments filed on 9/21/2006 with respect to claims 1 – 26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Sakoda (US 6456669 B1) teach a data communication method, a transmitter, and a cellular radio communication system which are capable of transmitting data while reducing the influence of fading caused on the transmission path.

- Tolmunen et al. (US 6658235 B1) disclose a method for transmitting control information in a communication system comprising at least one base station subsystem and a wireless terminal, in which method a set of alternative values are defined for said control information, information is transmitted in packet form between the base station subsystem and the wireless terminal, the packets to be transmitted on a communication channel are transformed into

bursts, and at least one burst formed of a packet is supplemented with at least one item of control data, wherein at the receiving state, the control data received in the burst is examined.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ACL/ Dec 13, 2006

WING CHAN
SUPERVISORY PATENT EXAMINER